



## POSITION STRONGER IN WORD'S TRADE

All Signs Indicate Prices Will Be Sustained Near Present Level

## Cuban Harvest Well Under Way and Java Expects a Surplus

Sales of raw sugar at New York for the week ending December 30 were 50,000 bags Porto Rican at 4.45; 10,000 bags Cuban at 4.64, and 11,000 bags at 4.58.

Cuban statistics reported by Willett & Gray showed receipts, 27,704 tons, against 12,683 tons last week, 22,000 tons last year and 30,000 tons in 1915. Exports, 11,196 tons; Stock, 31,903 tons, against last year 22,000 tons.

Centrals grinding 92, against 64 last week, 51 last year and 96 in 1915.

Stocks in the United States and Cuba together of 139,676 tons, against 138,875 tons last week and 245,931 tons last year, a decrease of 106,255 tons from last year.

## Future Positions Strong

Their report in part states there was nothing of interest during the week.

The only thing that calls for special comment is the decline in the market quotation for nearby positions, which as we went to press last week was at 4.89c, but has since declined to 4.64c.

The future positions have been well maintained in value in spite of the favorable weather and the increasing number of Centrals working in Cuba.

Early January still continues on offer at 4.64c and while it is still possible to buy a moderate quantity of all January at 4.45c most of the holders are asking fractional advances from this figure. February-March is offered at 4.33c to 4.39c.

Porto Ricans have shown a further decline for early shipments, and these sugars are now quoted at 4.45c.

A sale was reported during the week to France of 8,000 tons Cuban, February-March loading, at 2.95c f.o.b. Cuba, and a sale of 16,000 bags of December loading sugars, purchased to complete cargo on loading for England, is also reported at 3.50c f.o.b. Cuba.

A quite active market is reported during the week in full duty paying sugars (Perus, San Domingos, etc.) at 2 1/2 c.e.f. for early January and 3 1/4 c.e.f. for late January shipments to New York and Canadian refiners. The sales total about 10,000 tons.

## Cuban Harvest Well Under Way

The new crop Cuban receipts are increasing, being 27,704 tons for the week ending December 29, against 22,000 tons for the corresponding week last year. New crop exports for the week were 11,196 tons, compared with 6,000 tons last year. Included in the exports, according to Mr. Himely, were 2040 tons shipped to Europe. New crop stock, December 27, is 31,903 tons and old crop stock 720 tons.

Last year new crop stock was 22,000 tons and old crop stock none, the final exports having been made during that week. On December 27 there were 77 Centrals grinding, compared with 51 and 96 for the corresponding dates of the two previous years.

Latent cane prices to us report 92 Centrals as grinding. The weather during the first part of the week was fine, but during the latter part was reported as unsettled.

## Java Crop and Estimates

We have a special cable from Java this week reporting that the outlook of the crop, which started harvesting on May 1, 1915, reached 1,254,000 tons, against 1,303,045 tons as the final output of the preceding crop. Cable and mail advices state that the prospects for the present crop now growing, which will commence harvesting May 1, 1916, are very favorable, and that a comparatively large crop is possible. The figure of 1,254,000 tons is mentioned as a fair indication of the outcome. Of course, there are still some months of growing weather ahead for this crop and estimates can be materially changed by unfavorable weather.

## Refined Sales Normal

The week has been quiet and uneventful. Quotations have continued generally at 5.85c, but on one day during the week the Federal, who had a small balance of a few hundred barrels to dispose of, reduced their price to 5.83c; but as we go to press, these lots have been disposed of, and this refiner is now withdrawn from the market.

All refiners are now in a position to ship promptly.

We hear of no important business being placed for export, the quotation for which remains nominally 4.90c for moderate-sized lots for early shipment.

## Some Beets Planted

Beet planting for 1916 beet crop has commenced near Visalia, Cal. The campaign at Shreveport, California, closed December 15, after a very successful season.

The Michigan Sugar Co. is reported to have started the contracting of acreage at the same basis (\$6) as last year. The Crosswell factory ended the campaign during the first half of December, the acreage being light because of the wet season.

## Foreign Conditions

Germany, December 3, 1915.—The past week opened with heavy snow and sharp frosts, which moved from the west to the east, but it also grew warmer and changed to rain. These stormy

## MORE EFFICIENCY IN GAS ENGINES

Steam is a by-product of internal combustion engines if an enclosed cooling system is used, and only steam is allowed to escape. J. B. Marlin, displaying this point in Gas Engine, stating that the total heat units of the fuel lost to the water jackets are fully recovered and returned to the steam. In fact, such a system no difficulty nor detrimental effects was experienced when operating the engine at maximum load with the jackets under full steam pressure and temperature.

Another marked advantage in this process is found in the fact that the thermal efficiency of the engine is improved so that the fuel consumed is at least two per cent less at maximum load and fully fifteen per cent less at one-fourth load.

**Increasing the Efficiency**

An engineer writing to Power describes another method of increasing the efficiency of gas engines. The latent heat of the exhaust gases and the working charge then admitted under pressure. This increases the weight of the charge and consequently raises the mean effective pressure.

The Arizona Agricultural Experiment Station, in Bulletin 15 recently published, gives much light on the subject of internal combustion engines. Mechanical losses of power in an engine are most important when the engine is only partly loaded, the bulletin says. "An engine should be run at three-fourths to full load." Continuous operation is an important consideration as the largest item of cost in the fixed charges.

## HOW CANE IS GROWN IN SOUTHERN SPAIN

Sugar cane is cultivated in the sheltered valleys in the South of Spain in heavily manured and carefully cultivated soils. The land is prepared by digging shallow trenches about three feet wide at the bottom and eight inches deep. Sprouted seed is planted in three rows in each trench, and covered with a light layer of earth. Cultivation consists in keeping the ground free of weeds and the trench is gradually filled in with loose earth until at the end of the summer the field is level.

The seed is planted in March or April. In July and August the crop is irrigated every two weeks and a dressing of about 2500 pounds of commercial fertilizers used. Irrigation stops about three weeks before the harvest, in January. The average yield is about twenty tons of cane per acre, the moisture content ranging from eight to fifteen per cent. The plantations yield annual crops for ten or twelve years and are then replanted.

## Cuban Freights Lower

Cuban sugar freights will be lower before they are higher, a prominent sugar broker, writing under date New York, N. Y., December 30, 1915.

"While freight rates are high, owing to light available tonnage in the near future, it is well to bear in mind that the 'allots' of coffee to Europe and the United States have been exceptionally large during the past couple of months, showing no lack of steamers, and no small number of vessels will be employed in the coffee trade during the first six months of next year. The Cuban carrying trade between here and Cuba is the more attractive. At anything like the present prices Cuba and Porto Rico may be expected to hurry their production to market."

## New York Market Dull

Alexander & Baldwin received cabled advices from their New York house yesterday stating that there is no change in the sugar market, which remains dull.

Conditions have stopped field work, and the high temperatures are especially unfavorable for the beets in store. However, this is not of great importance any longer, as most of the factories are through the campaign.—(P. O. Licht.)

Austria-Hungary, November 21, 1915.—The weather of the past week met the desires of the sugar factories and farmers, being for the most part dry with light frosts, so that the delivery of the pulled beets again went forward smoothly. The lack of teams, and especially wagons, has frequently interrupted deliveries at the factories, in some cases very seriously, and is continuing to get worse, so that many factories are very much behind in their work.—(Vienna, Wochenschrift.)

## Campaign Has Ended

Holland, November 22, 1915.—Much snow, mixed with rain, fell during the first days of this week. Temperatures sank continually, and dry weather and frost followed. Tonight the thermometer registered 5 degrees below freezing, which is very low for the time of year and indicates an early opening of winter. The beet crop is ended almost everywhere.—(Deutsche Zuckerindustrie.)

Sweden, On November 21 the export embargo was officially removed. Mild, damp weather during the first half of November proved favorable for the completion of the beet harvest, which had been delayed by the severe frosts of October. The field yields are turning out about 27.5 tons per hectare, against 20.3 tons in 1914-15. The end of November is expected to see the end of the campaign in all sections.—(P. O. Licht, November 20, 1915.)

Denmark.—Owing to the results of the domestic beet harvest, the government has announced that no export will be allowed.—(P. O. Licht, November 26, 1915.)

## NEW USE FOR SUGAR TO SAVE MANURE

Molasses Added To Liquid Manure With Pure Cultures of Lactic Bacteria

Prevents Decomposition and Loss of Ammonia—Best Part of Fertilizer

A new use for waste molasses on the plantations is in connection with the better utilization of liquid manures. German agricultural chemists have borrowed a leaf from the silage process, and have perfected a method for preserving lactic acid-forming bacteria. Lactic acid is normally present in all correctly fermented silage. It is what prevents the loss of the nitrogenous elements from the feed. Badly made silage loses its nitrogen in the form of ammonia and hence is not good feed, and the chemists find that such silage usually contains no lactic acid. The lactic acid is what preserves silage from decomposition and makes it good feed.

The difficulty of storing liquid manures in tanks and cisterns has always been the danger of decomposition setting in and the loss of the nitrogen as ammonia. The German agriculturists have experimented on how to preserve liquid manures.

## Use Pure Cultures

They recommend water-proof cisterns as the first requirement. Then to every hundred tons of liquid they first add five per cent of waste molasses and then inoculate it with a pure culture of lactic bacteria. Within a few days the bacteria begin to form the acid. The nitrogen of the urea and organic matters in the liquid manure is fixed into soluble, non-volatile chemical combinations, and so long as the liquid remains acid ammonia is given off.

There is more fertilizer in the liquid portion of excrement than in the solid portion. On a cash valuation basis the fertilizer ingredients of stable manure are worth about \$2.50 per ton. The liquid manure is mostly allowed to go to waste.

## Increases Money Value

In the experiments cited the commercial value of liquid manures which had gone through the lactic acid treatment averaged about \$7.50 per ton. When it is remembered that a 1200-pound horse or stein produces about fourteen tons of excrement a year, the necessity for preserving as much of this fertilizer as possible is apparent. The bill for commercial fertilizers can be reduced and crop yields per acre increased if annual dressings of stable manure, both liquid and solid, are applied to the land.

In Germany, where lactic fermentation of liquid manures is practiced on a large scale, as soon as the lactic fermentation is complete the top of the cistern is covered with oil. This absolutely prevents further changes, or decomposition, and loss of nitrogen. Adjuvant molasses or sugar is a necessary preliminary to "seeding" the manure with lactic bacteria.

## LOOKING FORWARD AND BACK FROM 1915-1916

January 1, 1915, raw sugar sold at New York at 4.01 and December 31, at 4.64. The lowest price during the year was 3.64 on October 4 and the highest 5.20 on December 2. Willett & Gray state that the year 1915 has been remarkable for its numerous fluctuations in raw sugar, 105 changes in prices having occurred against 94 in 1914, the latter including the numerous changes incident to the outbreak of the European war. Refined sugar changes were not so numerous, there being 31 fluctuations in 1915 against 43 last year.

## Future Position Is Strong

Regarding the course of prices in 1916, although the estimates of cane crops and the American beet crops show slightly larger than 1915, still all dip molasses or sugar is a necessary preliminary to "seeding" the manure with lactic bacteria.

While the average price for 1915 has been slightly over 3 1/2 c. f. for 96° Cuban, or say 3 1/2 c. f. with the war continuing prices for 1916 may be expected to run somewhat higher than in 1915. Cuban Planters Are Fit

This is especially so, as Cuba after a year and a half of large crops, accompanied by very high prices—a combination that rarely exists—is in a strong financial condition, and there will be very little actual forcing of sugars on the market, except possibly during the period of large production in February-April. The position of Cuban raws is strengthened by the formation of a \$50,000,000 corporation, and which we understand has purchased about twenty-four Cuban factories scattered throughout all parts of the island, and which is expected to have an important influence on the market during the coming year.

## RAINS CHECKED GRINDING BUT DID NOT INJURE CANE

The plantation managers were all too busy with field work to write reports this week, the agencies reported yesterday. The storm was pretty general all over the group but no serious damage resulted other than the washing out of Honolulu landing and some injury at Hahione and Maui, previously reported.

E. Paxon Bishop said there has been no loss to speak of in the fields. There were high winds at Hilo, Oahu, in Hamakua and Kauai but not too much rain. The worst were the fields and the loss was highest along the coast. In places the effect of the salt spray after inland will show on the growing cane a few months hence.

## Heavy Snow On Hawaii

At Oahu there was practically no rain. Visitors at the Volcano House reported the weather clear and very cold, and becoming pleasantly rainy yesterday said there has been a tremendous fall of snow on the two peaks, Mauna Loa and Mauna Kea. The high mountains were white clear down to the timber line.

John Waterhouse said the storm has slowed up grinding on all the sugar plantations. "There is nothing to be waiting," he said. "Heavy rains always affect the juice, and the plantations gain sugar by slowing down harvesting at this season. This year another factor is the long time it is going to take to get sugar cargoes to Atlantic ports via Mexico. Delays now might result in saving time if the Canal is opened for traffic again. Nothing is lost by waiting."

The heaviest rainfall reported at any plantation was seven inches last night at Lahaina, but the fields did not suffer. On Oahu the rain was general, but not too heavy. On Maui, Waianae got two and a half inches, and in small doses that soaked into the fields. Kauai had heavy rains, without serious damage.

## UNCLE SAM LENDS PLANTERS AN EXPERT—ENTOMOLOGIST

P. H. Timberlake of the bureau of entomology, United States department of agriculture, who has been assisting to exterminate alfalfa pests in Utah, arrived by the Lurline yesterday to join the staff at the experiment station of the Hawaiian Sugar Planters' Association.

He has been lodged to the station here by the government, to aid the experimental station in its efforts to find parasites which will destroy the cane beetle, Japanese beetle and other insects destructive to cane. Two members of the local station's force, H. T. Oshorn and Frederick W. Muir, are in the Orient searching for such parasites at the present time. Mr. Timberlake will remain here about a year.

The banana beetle itself does not attack the cane, but it lays its eggs on the cane roots and the larvae later feed upon them.

## After the Flood

Experience has proved that now is the time to use nitrate of soda and keep the cane from going back. Floods of rain such as have fallen during the last week rob the top soil, where most of the fertility is, washing away both soil and fertilizer. A light application of nitrate the first dry day will do a world of good.

The value of trash mulches in holding back water and preventing wash will probably turn more attention to this practice. Very little has been said of this benefit from leaving the trash on the fields. A trash blanket protects cane fields from wash just as undergrowth and fallen leaves prevent the erosion of soil in forested areas.

## Brazilian White Sugars

The "phosphogloss" process of sugar manufacture has been adopted in a number of factories in Bahia province, Brazil. A mixture of bleaching phosphoric acid and potassium is added to the juice after it has been limed. The advantage claimed is that it improves clarification, produces a white sugar, and the filter seems to have very high fertilizer value. Published analyses of these sugars show twenty-seven per cent organic matter and nine per cent phosphoric acid.

## Philippine Jute

Jute experiments are under way in the Philippines. In recent fertilizer trials the best results were obtained by using nitrogen. The percentage of fibre in the stalk can be increased by seed selection and the amount of the total crop per acre by proper cultivation and fertilization.

## Scientific Bug Lore

Prof. A. Baskin who spent a year here investigating the pink boll worm of cotton for the United States department of agriculture has recently published a number of scientific papers on the microlepidoptera of forest trees, insects nearly related to the cotton pest.

## Mixing Cyanamide

Cyanamide and superphosphate do not "mix" well in commercial fertilizers. Recent experiments in mainland factories indicate that the limit is sixty pounds of cyanamide to 1000 pounds of superphosphate in the ton. More than that proportion causes caking and other changes.

## HOW MUCH LIME SHOULD BE USED?

Experiments Prove That Just Enough To Destroy Acidity Is Enough

Experiments to determine the lime requirements of soils have been conducted at Rothamsted for more than sixty years. In a recent report H. B. Hutchinson and K. MacLennan state that "the amounts of lime necessary to produce specific results vary in different soils." The critical amount required has been found to depend on the amount necessary to produce an alkaline reaction in the soil water. The right proportion to use, on this basis, can be determined by any agricultural chemist.

The results of a number of pot, plot and field experiments showed that maximum production of dry matter in the first four crops coincided with the presence of just enough lime to make the soil alkaline. When more than enough lime to produce alkalinity was used there was no increase of crop corresponding to the additional quantity of lime. The lime requirement of the soil was found to depend on the absorptive capacity of the soil for bicarbonate of lime. Where lime had been previously applied, even ten to twenty years before, there was less absorption of the bicarbonate. Neutral soils absorbed none at all.

Showing a positive lime requirement according to this method were found to respond distinctly to the application of carbonate of lime, by increased ammonia and nitrate production in laboratory experiments, and by greater growth in pot culture and fieldwork. So long as there was an acid condition of the soil the carbonate and oxide, or burned lime, were of equal value. The experiments declare as a result of their tests and investigations that the ordinary tests to show the lime requirements of soils by measuring the carbonates present are of little value. The actual lime requirement depends first on whether the soil is acid. The acidity test is the more important.

## Weather Is Moderating Everywhere

(From Wednesday Advertiser)

Weather at Hilo and other island ports is improved. The storm appears over. Interference with shipping is about at an end.

The inter-island steamer Mauna Kea, yesterday from Hilo, reported the weather moderating along the Hawaii and Maui coasts. There remained a fresh north wind and a northerly swell. From Molokai to Honolulu the wind was north to northwest with a northerly swell, which was falling off. The Mauna Kea, yesterday from Maui, reported, was at Hilo holding to the s-shearer Mawewa, which dragged anchors and got her chains twisted, and to which the Nihaui had been trying to get lines Sunday. Theo. H. Davies & Co., consignees of the Mawewa's lumber cargo, had received no advices concerning the schooner, which was taken as indicating that her difficulties were lessening, as they would with the weather moderating.

## No Work At Hilo

Heavy weather at Hilo Friday to Monday prevented all work, the Mauna Kea reported. The storm was the heaviest of years, and the snow-line was low for some time. Outward from Honolulu Saturday the Mauna Kea met a strong northeast wind and a heavy swell. She was unable to land at Lahaina, then lying outside Lahaina, to land in the morning. At Hilo there were a strong northwest wind and a heavy northerly swell, and the steamer was unable to make the railroad wharf. She sent one boat with mail and passengers to the railroad wharf, but a heavy swell made the landing difficult so she picked up her anchor and ran into the inner harbor, landing the remainder of the passengers in boats at Kuhio wharf. Monday she tried to go alongside Kuhio wharf to land freight but was unable to lie alongside, so she pulled out again and took her passengers and mail off in ship's boats. Except for the baggage, ice-house freight and one automobile, she brought back all her Hilo cargo. Claudine Probably Works

It is presumed that the inter-island steamer Claudine was working at Kahului yesterday, as despatches Monday said she would be able to work.

## PARENTS OF TRIPLETS TAKE TREASURES HOME

With nine dollars and fifty cents subscribed through The Advertiser and some dollars more, the Mattos triplets returned to Koloa, Kauai, yesterday afternoon with their parents, Mr. and Mrs. Francisco M. Mattos. It is understood that Mattos, who was drawing twenty-four dollars a month, has had his pay increased. M. A. Peixoto was the last contributor to the Mattos triplets fund. He handed in a dollar yesterday to The Advertiser.

## LONDON MAIL FIGURES ON 1916 SUPPLY

The London Mail reports, December 9, that there has been little change in the prices of white sugars as fixed by the Royal Commission, except as regards Cubes, which have been reduced from 50s to 40s per cwt.

It is now an open secret that the government have purchased upwards of 300,000 tons of Cuban raws for January-March shipment, to which may be added probably some 50,000 tons imports from Peru, Brazil, West Indies, etc., a total supply sufficient for the meeting requirements of our refineries, on the basis of 75,000 tons per month, for a period of nearly five months.

An estimate of prospective United Kingdom supply and demand is that requirements will be 1,740,000 tons. France may require to buy 340,000 tons. Her beet crop is only 120,000 tons and estimated available for import from the French colonies only 120,000 tons.

Total American and foreign supplies available for European supply are estimated by London Mail as only 2,500,000 tons. Cuban production for export is estimated at 2,065,000 tons; U. S. raws, 200,000 tons; Porto Rico 370,000; Hawaii 275,000; U. S. beets 750,000; Philippines 75,000. Total supply 5,030,000 tons, from which must be subtracted U. S. consumption 3,700,000 tons, leaving available American surplus, 1,270,000 tons.

Other supplies are estimated, Holland, 80,000; Mauritius, 180,000; West Indies, South and Central America, 370,000; and Java 600,000; and, for Java crop may be very large; and, for Java crop may increase its crop by 125,000 tons.

## Irish Beet Tests

Sugar beet experiments which have been conducted in Ireland indicate that a considerable share of the British sugar requirements may be filled from that source if the necessary factories are established. The yields of the best plots were 17.9 tons gross, and 14 tons net, factory weight. The average sugar content of the beets ranged from 16.1 to 17.0 per cent and the apparent purity from 89.2 to 89.6.

## MARSHAL SMIDDY FAILED TO FIND WOMAN'S HUSBAND

Filed on July 12, last year, the divorce papers in the case of Mrs. Lottie Wallwork against John Wallwork were returned to the local circuit court yesterday unserved. Marshal Smiddy, who made search for the husband in Pago Pago, Samoa, reported that the divorce could not be served. The Wallwork were married in Honolulu on July 12, 1909, by Rev. Father Ulrich Richard, and have two sons, five and three years of age, respectively. Non-support and desertion are charged by the wife against the husband. Service will now be made by publication in a local paper.

## CONVINCING CURE OF SKIN TORTURE

Slight Red Eruption Grew to be Terrible—Sleepless Nights and Restless Days Made Life a Burden—Was Completely Discouraged.

## CUTICURA CURED AFTER 16 YEARS OF SUFFERING

"For sixteen long years I have been suffering with a bad case of skin disease. While my child was born I had a great deal of trouble on the legs just in back of my knees, caused by a light, glandular eruption. At first it seemed to be a slight ailment but gradually it spread from back to front, and at last I was a miserable creature. I tried many home remedies and saw many doctors in different cities but to no satisfactory result. The plague bothered me more in winter weather than in summer and being on my feet it made it impossible for me to walk, and I was forced to stay indoors in the warmest weather."

"My hopes of recovery were by this time spent. Sleepless nights and restless days made life an unbearable burden. At last I was forced to try the Cuticura Remedies and I did not need more than a trial to convince me that I was on the road of recovery. This time I bought two boxes of Cuticura Remedies (Cuticura Soap, Ointment and Pills) and after these were gone I was a different man entirely. The Cuticura Remedies certainly did a great deal for me, as it changed my whole career from bad to good. I am now the happiest man that there is at least one true cure for skin troubles of this kind. I live at 11 Westland Ave., Brooklyn, N. Y., July 30 and Aug. 6, 1907."

Heat and peace fall upon distracted households when Cuticura cures. All skin diseases of the face, neck, arms, legs, etc., are cured by the use of Cuticura Remedies. Guaranteed absolutely pure and may be used from the hour of birth.

Cuticura Soap (25c), Ointment (25c), Resolved Pills (25c). Sold everywhere. Cuticura Remedies Co., New York, N. Y.

## MANLAND FARMERS SHY OF FERTILIZERS

Secretary of Agriculture Reviews Bad Situation and Offers Good Advice

The secretary of agriculture at Washington has issued a resume of the fertilizer situation in the United States. He states that in 1913, when conditions were normal, about \$125,000,000 worth of commercial fertilizers was used in the United States. Of this amount, the farmers paid \$48,800,000 for nitrogenous substances, \$56,000,000 for phosphates, and \$20,450,000 for potash salts.

Practically all the potash salts were imported from Germany and the entire quantity of nitrate of soda came from Chile. Ammonium sulphate to the value of \$3,720,000 was received from abroad, mainly from England. The remainder of the fertilizer materials was derived from domestic sources.

There is practically no potash in this country at the present time for fertilizer use. The small quantities which were held over from former years are now priced at from eight to twenty times their normal value. While potash is indispensable in the preparation of fertilizers, it is also used for many other purposes, including the manufacture of matches, glass, liquid soap and munitions. The price of potash under existing conditions by the manufacturers of such articles undoubtedly will cause practically the entire output of these concerns to be diverted from the fertilizer industry.

It seems unlikely that normal conditions will be restored in the immediate future and that potash can be secured from foreign sources as heretofore in time for the next crop planting season. It also seems improbable that private enterprise will provide potash from domestic sources for agricultural purposes in time.

**Phosphates and Nitrogen**

Acid phosphate is the basis of nearly all commercial mixed fertilizers. It is made by the action of sulphuric acid upon phosphate rock. Only available sources of phosphate rock are greater than those of any other nation.

The nitrogen situation is of less pressing concern.

Owing to the demand for nitric acid for munition purposes, the price of nitrate of soda advanced approximately \$1.10 per hundred pounds during the year prior to November, 1915.

One of the most important sources of nitrogen for commercial fertilizer purposes is ammonium sulphate. This is produced as a by-product in the destructive distillation of coal for the preparation of coke. The nitrogen contained in the coal is evolved as ammonia and is caught and neutralized with sulphuric acid. Formerly all coke was made in the beehive oven which did not provide for the condensation of the combustible gases produced. These were burned as evolved and the ammonia carried by them was likewise lost.

## Americans Waste Supplies

The domestic production of ammonium sulphate from the coke oven is only one-fifth of what it could be. The beehive oven entirely displaced by more modern types. During the past few years there has been a slow transition from the use of the beehive oven. It is not imperative, therefore, to resort to extreme measures to increase the production of ammonium.

The Bureau of Soils is studying also the problem of the fixation of atmospheric nitrogen with a view to develop a method for the production of ammonium phosphate and other forms of concentrated fertilizers. No ammonium phosphate is being made in this country at the present time.

Save and Use Manure

In the unusual conditions existing in the fertilizer trade, it is important that all fertilizing materials on the farm, especially those containing potash, should be conserved. The fertilizer ingredients already existing in the soil should be utilized and developed to the fullest extent.

Of the organic substances, manure, both solid and liquid, is the most important and should be utilized wherever possible. All material of an organic nature, such as leaves and bedding of various sorts, should be composted and the compost applied to the soil, special attention should be given also to the conservation of wood ashes. Depending on the character of the wood, they contain potash in quantities varying ordinarily from three to ten per cent. Old tree trunks, branches, cuttings, etc., should be burned and the ashes derived therefrom utilized.

## Arsenic in Soils

Where arsenite of soda is used for killing weeds all of the arsenic is fixed in the top four inches of soil. A sufficient concentration of arsenic to injure growth of crops would not result in less than fifty years at the rate it is being used on Hawaiian plantations even counting on there being no loss of soil through washing under terrestrial rains.

## Plowing in Seed Cane